



exposure area provide fairly consistent estimates of the mean. All parties agree that uncertainties in the estimates of the mean concentrations will be addressed in the uncertainty analysis." Add the following sentences: "For OUs 2-7, additional field sampling in support of baseline risk assessment must be mutually agreed to by EPA, CDH, and DOE. On a case-by-case basis, with the approval of the regulators, geostatistics may be utilized to incorporate spatial continuity of data."

- d) Add the following definitions: **area of concern** = one or several sources grouped spatially in close proximity; and **source** = area defined by 1) contaminant levels exceeding background mean plus 2 standard deviations for inorganics and/or 2) detection limits for organics.

If you have any questions regarding these matters, please call Joe Schieffelin of my staff at 692-3356.

Sincerely,



Joan Sowinski, Program Manager  
Hazardous Waste Control Program

enclosure

cc w/enclosure:

Martin Hestmark, EPA  
Shirley Olinger, DOE  
Jessie Roberson, DOE  
Sue Stieger, EG&G

### Conservative Risk Screen for Sources<sup>(1)</sup> at the Rocky Flats Plant

This risk screen will be the first step in the risk assessment process used at Rocky Flats and will be the basis and justification for the type of next steps taken at a given OU (please see attached flow-chart).

The steps in the conservative risk screen are as follows:

1. An entire OU RFI/RI data base will be compared to background using the previously agreed upon Gilbert methodology. (flowchart, block 1)
  - The product of the background comparison will be a list of potential contaminants in the OU. This list will consist of all organic chemicals that exceed detection limit somewhere in the OU, and all inorganic chemicals whose OU population exhibits a significant statistical increase in concentrations compared to the background population either over the whole OU or within some portion of the OU.
2. This list of potential contaminants will be used as the basis for the "nature and extent" evaluation for each OU. Within this evaluation, source areas will be delineated. For organic chemicals on the list, the delineation criteria will be the detection limit; for inorganic chemicals on the list, the delineation criteria will be the arithmetic mean of the background data set plus two standard deviations from the arithmetic mean. (flowchart, block 2)
  - It is recognized that each chemical in each medium may have a different spatial extent within a source. These different spatial extents do not affect the implementation of this screen. A "source," however, will be all contamination that can reasonably be tied together based on existing knowledge of the site, contaminant types, concentrations, rates of migration, etc.
3. For each potential contaminant in each medium, a medium-specific "risk based concentration", or RBC, must be calculated. These RBCs should be calculated based on: 1) direct "residential" exposure and intake parameters, 2) direct ingestion, dermal contact, and inhalation pathways only, and 3) assuming a carcinogenic risk of  $1 \times 10^{-6}$  and a non-carcinogenic hazard quotient of 1.0. (These RBCs could be calculated once site-wide since they are chemical-specific and not location specific.)

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<sup>1</sup> Source = Area defined by 1) contaminant levels exceeding background mean plus 2 standard deviations for inorganics and/or 2) detection limits for organics

4. For each source delineated in #2 above, it is necessary to determine the **maximum** contaminant levels for each potential contaminant in each affected medium.
5. Once the maximum contaminant levels have been determined, each media/contaminant-specific maximum should be divided by its respective RBC. These maximum/RBC ratios for each contaminant should then be summed for each medium and then across all affected media in a source. Those sources where the ratio sum is less than 1.0 have a risk less than  $1 \times 10^{-6}$  and/or a hazard quotient less than 1.0. Those sources where the ratio sum is greater than 1.0 have a risk greater than  $1 \times 10^{-6}$  and/or a hazard quotient greater than 1.0. (flowchart, block 3)
6. For sources where the ratio sum was less than 1.0, DOE would pursue a "no further action" decision, pending an ARAR analysis (flowchart, block 4). For sources that have a ratio sum greater than 100, DOE would pursue a "voluntary corrective action" but could proceed with a Baseline Risk Assessment (BRA) at their discretion (flowchart, block 5). For sources where the ratio sum was between 1.0 and 100, DOE would pursue a BRA, but could perform a voluntary corrective action at their discretion (flowchart, block 6).

# CONSERVATIVE RISK SCREEN

**Block 1**  
Background comparison – entire OU data set compared to background data set.

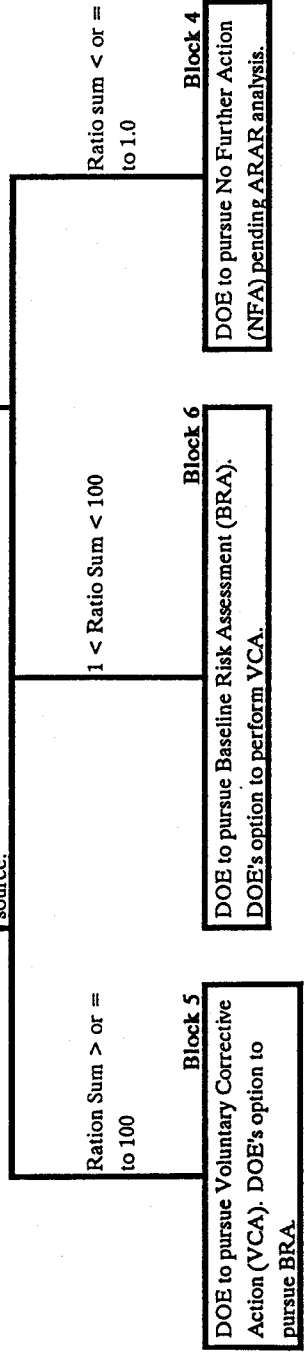
Per Gilbert methodology previously agreed upon.

**Block 2**  
Source area delineation – A source = any area where contaminant levels exceed:  
1) detection limits for organic constituents, and  
2) arithmetic background mean plus two std dev. for inorganic constituents.

Per "nature and extent" evaluation.

**Block 3**  
Determine the value for the following ratio for each contaminant in each affected media at a source:  
MAXIMUM concentration of each contaminant  
Media & Contaminant – Specific Risk Based Concentration (RBC)  
  
The values for this ratio should then be summed together appropriately yielding a Ratio Sum for each source.

RBCs based on:  
1) direct "residential" exposure parameters, 2) direct ingestion inhalation, and dermal contact,  
3) 10E–6 carcinogenic risk and 1.0 hazard quotient.



6/5/5